## CALIFORNIA BUTTERFLY NOTES—II.

By Karl R. Coolidge, Hollywood, California.

### **Papilio zelicaon** Lucas.

Carrots, turnips and parsnips serve as food-plants for this species, and also orange and lemon trees, to which I called attention in Pomona Journ. Ent., p. 33, 1910. In the San Joaquin Valley citrus trees form an important factor as larval food, but much less so about Los Angeles, only two or three instances having been reported here. In addition, the following food-plants are known to me:

*Ammiaceae.*

*Carum kelloggi* Gray.—A commonly used food-plant in the San Francisco Bay region.

*Carum gairdneri* (H. & A.) Gray.—In Ventura County.

*Foeniculum foeniculum* (L.) Kaisert (= *vulgare* Gaertn.).—Sweet Fennel, a native of Europe and long ago introduced to California. This seems to be everywhere the preferred food.

*Daucus pusillus* Michx.—Rattlesnake Weed. A popular food-plant throughout the chaparral belt.

*Eulophus bolanderi* C. & R.—In the damp meadows of the higher mountains.

While the life history of *zelicaon* has been published a number of times, I can find no detailed description of the egg, and so offer the following:

*Egg:* Nearly globular, broader than high, the base sharply flattened, the summit broadly rounded. The surface covered with excessively fine granulations. The micropyle in a flat circular obscure field, scarcely depressed; the micropylar cells round, very minute, about .005 mm. in diameter.

Color, when first laid, a very pale greenish yellow, but the green soon becomes lost and the coloration is then uniformly a pale honey yellow. In three or four days the egg becomes blotched with reddish brown, a jagged circular band appearing about the middle, and a distinct even edging about the micropyle; where the surface is unblotched the coloration is a sordid gray. Finally, just before the young larva emerges the egg becomes a solid deep purple.

Base .86 mm. in diameter, but varying slightly. As in other *Papilios* there is considerable variation in the diameter

and height, six eggs from the same female showing the following:

| | | | | | |
|---|---|---|---|---|---|
| 1.—Diameter | 1.20 | mm. | Height | 1. | mm. |
| 2.— " | 1.08 | mm. | " | 1. | mm. |
| 3.— " | 1.08 | mm. | " | .92 | mm. |
| 4.— " | 1.10 | mm. | " | .94 | mm. |
| 5.— " | 1.10 | mm. | " | 1. | mm. |
| 6.— " | 1.16 | mm. | " | 1. | mm. |

**Euphydryas chalcedona** Dlb. & Hew.

A new food-plant for this species is *Collinsia bicolor* Benth., popularly known as "Chinese Houses," upon which I found numerous larvae feeding in Ventura County, 1918.

**Melitaea gabbi** Behr.

*Melitaea gabbi* Behr is known from California, Utah, Nevada and Arizona. It is a common vernal species in Southern California, occurring as far north along the coastal region as Pacific Grove, in Monterey County. About Los Angeles it is one of the early spring butterflies, usually appearing in the first week of March, but is not out in full force until the latter part of that month, or in early April.

*Gabbi* has always been considered a single brooded species but occasional captures made in later months caused me to believe that at least in part it was double brooded. In 1921, in a spot near Hollywood where the butterfly is quite abundant, I made a careful check of its appearances.

The spring of 1921 was an unusually late season, and the first appearance, a ♂, was noted April 2. By April 7 a number were out, and the 15th saw the species in full flight. From then on I visited the spot almost daily, and by May 2 the brood had entirely disappeared.

But on July 1 six perfectly fresh specimens were captured and others seen. On July 6 fourteen more were netted, including several pairs in copulo. Again, on July 13, more examples were observed, now showing signs of wear and tear. From these records it is very apparent that in the lower coastal region about Los Angeles *gabbi* is at least partially double brooded. But whether these imagoes were the product of the first brood, or from hibernating larvae of the previous season, is another question. If from

hibernating larvae, then the individuals of the earlier generation may have issued from over wintering pupae. Is there any such instance known in our species of *Melitaea?*

All that is known of the life history of *gabbi* is a very meager description of the pupa by Minot, Ent. News, Vol. 13, p. 158, 1902. California collectors have considered that Owl's Clover (*Orthocarpus purpurascens* Benth.) is the food-plant of *gabbi.* The haunts of the butterfly are in the localities where this plant grows, and year after year I have noted that the appearance of the adults of *gabbi* is nicely in keeping with the blossoming of Owl's Clover. Yet repeatedly, season after season, I have confined gravid females of *gabbi* with plants of Owl's Clover, only to have them die without ovipositing.

My experience with the species of *Melitaea* is that those which lay their eggs in masses will deposit eggs freely in confinement, even when no sprigs of the proper food-plant are present. Several instances are known where *chalcedona* ♀ ♀ have come to life in papers and deposited eggs, and on other occasions supposedly dead females have laid eggs in the grooves of spreading boards. But those species which lay their eggs solitarily are a very different problem. I confined ♀ ♀ of *wrighti* for years before I could obtain eggs, one ♀ laying three or four more by accident than anything else.

On July 7, 1921, a pair of *gabbi* were taken in copulo and confined with *Orthocarpus.* They remained attached until the following day, and on April 10 the ♀ deposited seventy eggs, all laid in jumbled masses on the bottom of the confinement jar, the butterfly completely ignoring the *Orthocarpus.* On April 24 the eggs hatched, making this period fourteen days. I gave them fresh sprigs of *Orthocarpus,* but they refused to even consider it. Other Scrophulariaceae were then offered, plants found in the habitat of *gabbi,* these being *Diplacus longiflorus* Nutt., *Mimulus* species, and *Castilleia foliolosa* H. & A., but all were spurned, and two days later the last of the larvae passed away. The following descriptions were made:

> *Egg:* Subglobular. The base broadly but evenly rounded, .40 mm. in diameter, rounding out thence to the greatest breadth, .54 mm., in the middle of the lower half of egg. From this point decreasing evenly and rather rapidly to the summit, which is truncate, and but .24 mm. in diameter.

Arising in the upper third of egg a series of weak irregular ribs, at their origin .08 mm. apart, and the ribs themselves .018 mm. in thickness. The surface between them deeply concave, glistening, and traversed by some exceedingly faint cross striae, which basally form rather even quadrate cells, about .03 mm. in their shorter width. The lower two thirds of egg marked with numerous shallow punctulations, mostly circular or pentagonal, caused by scarcely raised lines. The surface contained in these cells exceedingly finely punctate. The micropyle in a deep circular pit, not greatly depressed, .20 mm. in diameter, and surrounded by the uneven terminations of the longitudinal ribs.

Color, when first laid, pale green, in some lights with a yellow tinge. The coloration is almost exactly that of the tender leaves of *Orthocarpus*. Height .60 mm.

*Larva at Birth:* Head .32 mm. in diameter, dark brown, shining; with a fringe of fine sharp, weak colorless spiculiferous hairs, .06 mm. in length and anteriorly projecting.

The usual round smooth warts, .03 mm. in diameter, arranged in the following series:

A laterodorsal row, centrally located; a lateral row, in middle of posterior half of segment; a suprastigmatal row centrally located; an infrastigmatal posterior; a ventrostigmatal anteriorly placed. On the thoracic segments all these series of warts become centrally located, or very nearly so.

The hairs arising from these warts .24 mm. in length, curving, finely pointed, brown in color, rather heavily spiculiferous.

Color of body a dull yellow, with a whitish sheen. Legs yellow brown, shining. Ventral surface and prolegs concolorous with body above. Spiracles round, with a fine fuscous ring. Length 1.20 mm. Width at first thoracic segment .26 mm.; width at anal segment .18 mm.